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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/779,257	02/07/2001	Behrooz Rezvani	VELCP001X1C	1481
28436	7590	05/19/2004	EXAMINER	
IP CREATORS			ODOM, CURTIS B	
P. O. BOX 2789			ART UNIT	
CUPERTINO, CA 95015			PAPER NUMBER	

2634

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/779,257

Applicant(s)

REZVANI ET AL.

Examiner

Curtis B. Odom

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25-28 is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-15, and 19-24 is/are rejected.
- 7) ☒ Claim(s) 4-6 and 16-18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 3 is objected to because of the following informalities: The word "derive" is suggested to be changed to "derives". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 11, 12, 23, and 24 recite the limitation "said at least one X-DSL protocol". There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 1-3, 7-15, and 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cioffi (U. S. Patent No. 5, 887, 032).

Regarding claim 1, Choffi discloses a system (Fig. 1) for suppressing interference in a communication of data channels across a common communication medium and the system for suppressing interference comprising:

a first set of modems (Fig. 1, block 102, column 6, lines 13-33) wherein the central office includes a first set of modems) coupled to the common communication medium for transport and reception of corresponding data channels there through;

a second set of modems (Fig. 1, blocks 114-118, column 6, lines 33-54, wherein the remote units are a second set of modems) coupled to the common communication medium for transport and reception of corresponding data channels there through; and

an interference canceller (Fig. 4, block 412, column 11, line 26-column 12, line 12) coupled with the second set of modems and configured to coordinate of selected interfering data channels (first line transmitting signal or interfering pairs of lines) of the first set of modems and the second set of modems with reception of a selected victim channel (second line receiving signal) at a corresponding one of the second set of modems and to adaptively derive interference cancellation coefficients (estimated coefficient ( $W$ )) between each victim data channel and each interfering data channel and to apply the derived interference cancellation coefficients to digitized samples of the data channels received by each of the second set of modems to substantially cancel interference in the digitized samples (column 11, lines 49-63).

Cioffi does not disclose the derivation of coefficients takes place during a training phase of communication and the interference cancellation takes place during a runtime phase of

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communication. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that communication phases consist of training phases between two communication devices in which certain parameters are measured and transmission/reception parameters are determined between the two devices for efficient communication. The training phase occurs before a runtime phase. A runtime phase is simply the phase in which the two devices are actually communicating data. Therefore, it would have been obvious that as long as the coefficients were derived before the interference cancellation phase that the derivation of coefficients could have taken place during a training phase of communication and the interference cancellation could have taken place during a runtime phase of communication. Thus, the time at which these operations take place is deemed a design choice and does not constitute patentability.

Regarding claim 2, which inherits the limitations of claim 1, Cioffi discloses the interference canceller adaptively derives both FEXT and NEXT interference cancellation coefficients for each victim data channel (column 11, lines 49-63), wherein the estimated crosstalk interference is both FEXT and NEXT.

Regarding claim 3, which inherits the limitations of claim 2, Cioffi discloses the interference canceller adaptively derive self-NEXT interference cancellation coefficients to substantially cancel an echo interference on each of the victim data channels (column 11, lines 49-63), wherein the estimated coefficient is self-NEXT interference cancellation coefficient (column 10, lines 40-47).

Regarding claim 7, which inherits the limitations of claim 1, Cioffi does not disclose the first set of modems and the second set of modems are each logical modems established by

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sharing signal processing power of a digital signal processor among multiple data channels.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the modems could have been logical modem. There are many different types of modems used for communication and thus choosing a type of modem for communication is deemed a design choice and does not constitute patentability.

Regarding claim 8, which inherits the limitations of claim 1, Cioffi does not disclose the common communication medium comprises a wireless medium. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the system of Cioffi could have been implemented using a wireless medium. The interference canceller could have conducted the same operation on a wireless medium with instead operating on each wireless data channel rather than the cable channels. Thus, implementing a wireless medium is deemed a design choice and does not constitute patentability.

Regarding claim 9, which inherits the limitations of claim 1, Cioffi discloses the common communication medium comprises a binder of subscriber lines (Fig. 1, block 112, column 6, lines 33-67).

Regarding claim 10, which inherits the limitations of claim 1, Cioffi discloses the data channels include data modulated in at least one X-DSL protocol (column 6, lines 1-7).

Regarding claim 11, which inherits the limitations of claim 1, Cioffi discloses at least one X-DSL protocol includes G.Lite, ADSL, VDSL, SDSL, MDSL, RADSL, and HDSL (column 6, lines 1-7).

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Regarding claim 12, which inherits the limitations of claim 1, Cioffi discloses at least one X-DSL protocol includes at least one of a discrete multi-tone (DMT) line code and carrier less AMIPM (CAP) line code (column 6, lines 1-7).

Regarding claim 13, Cioffi discloses an apparatus (Fig. 1) for suppressing interference in a communication of data channels across a common communication medium and the apparatus for suppressing interference comprising:

a plurality (Fig. 3, block 310, column 9, lines 6-63) of analog front ends (AFE's) each coupled to common communication medium for transmission and reception of corresponding channels of data there through;

at least one (Fig. 3, block 302, column 9, lines 6-63) digital signal processor (DSP) for processing the corresponding channels of data; and

an interference canceller (Fig. 4, block 412, column 11, line 26-column 12, line 12) coupled with the second set of modems and configured to coordinate during transmissions of selected interfering data channels with reception of a selected victim channel at a corresponding one of the plurality of AFEs to adaptively derive interference cancellation coefficients (estimated coefficient ( $W$ )) between each victim data channel and each interfering data channel and to apply the derived interference cancellation coefficients to digitized samples of the data channels received by each corresponding one of the plurality of AFEs to substantially cancel interference in the digitized samples (column 11, lines 49-63).

Cioffi does not disclose the derivation of coefficients takes place during a training phase of communication and the interference cancellation takes place during a runtime phase of communication. However, it would have been obvious to one of ordinary skill in the art at the

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time the invention was made that communication phases consist of training phases between two communication devices in which certain parameters are measured and transmission/reception parameters are determined between the two devices for efficient communication. The training phase occurs before a runtime phase. A runtime phase is simply the phase in which the two devices are actually communicating data. Therefore, it would have been obvious that as long as the coefficients were derived before the interference cancellation phase that the derivation of coefficients could have taken place during a training phase of communication and the interference cancellation could have taken place during a runtime phase of communication. Thus, the time at which these operations take place is deemed a design choice and does not constitute patentability.

Regarding claims 14, 15, and 19-24, the claimed apparatus includes features corresponding to the above rejection of claims 2, 3, and 7-12 which is applicable hereto.

### ***Allowable Subject Matter***

6. Claims 25-28 are allowable over prior art because related references do not disclose a method for suppressing interference by adaptively filtering selected transmitted interfering data channels with at least one selected received data channel to determine during a training phase interference cancellation coefficients there between; selecting for each received data channel at least one significant interfering data channel among the transmitted data channels based on the interference cancellation coefficients determined in the act of adaptively filtering; and exclusively applying during a runtime phase the interference cancellation coefficients associated



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with the at least one significant interfering data channel selected in the selecting act to digitized samples of each corresponding received data channel to substantially cancel interference in the digitized samples.

7. Claims 4-6 and 16-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Conclusion*

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Szechenyi (U. S. Patent No. 5, 271, 037) discloses crosstalk compensation for a receiving coupled to a plurality of transmission lines using adaptive filters.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 703-305-4097. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom  
May 10, 2004



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